AUG 0 5 2004
PATENT & TRADEMARK OFFICE

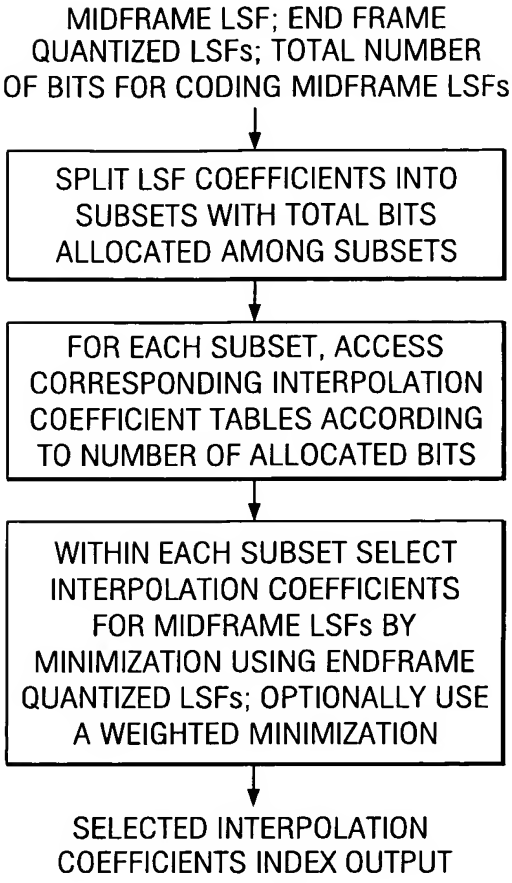

FIG. 1a

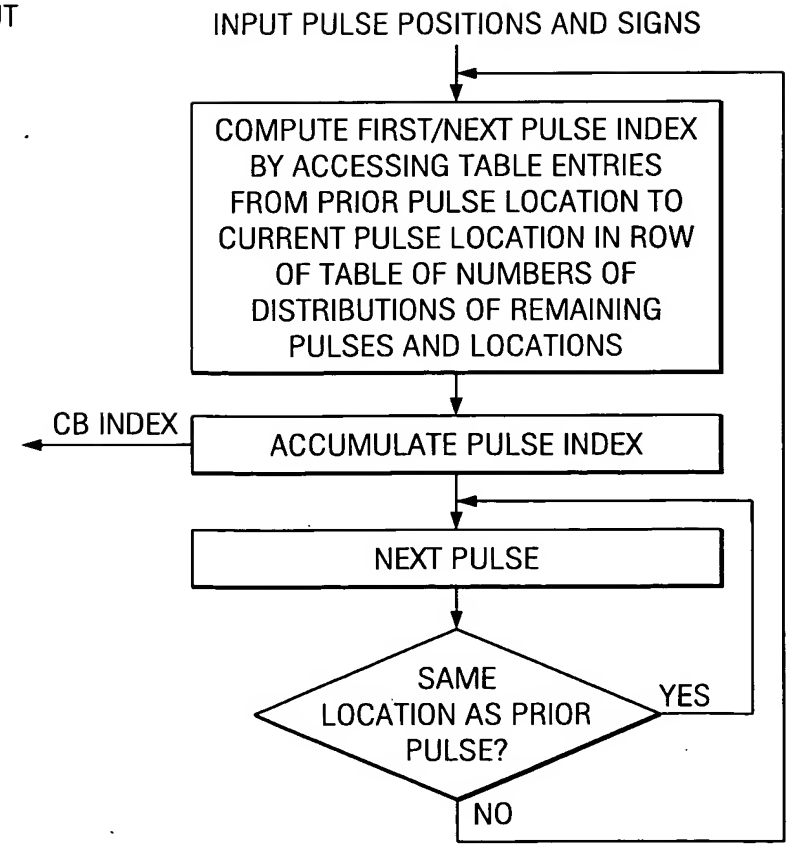

FIG. 1b

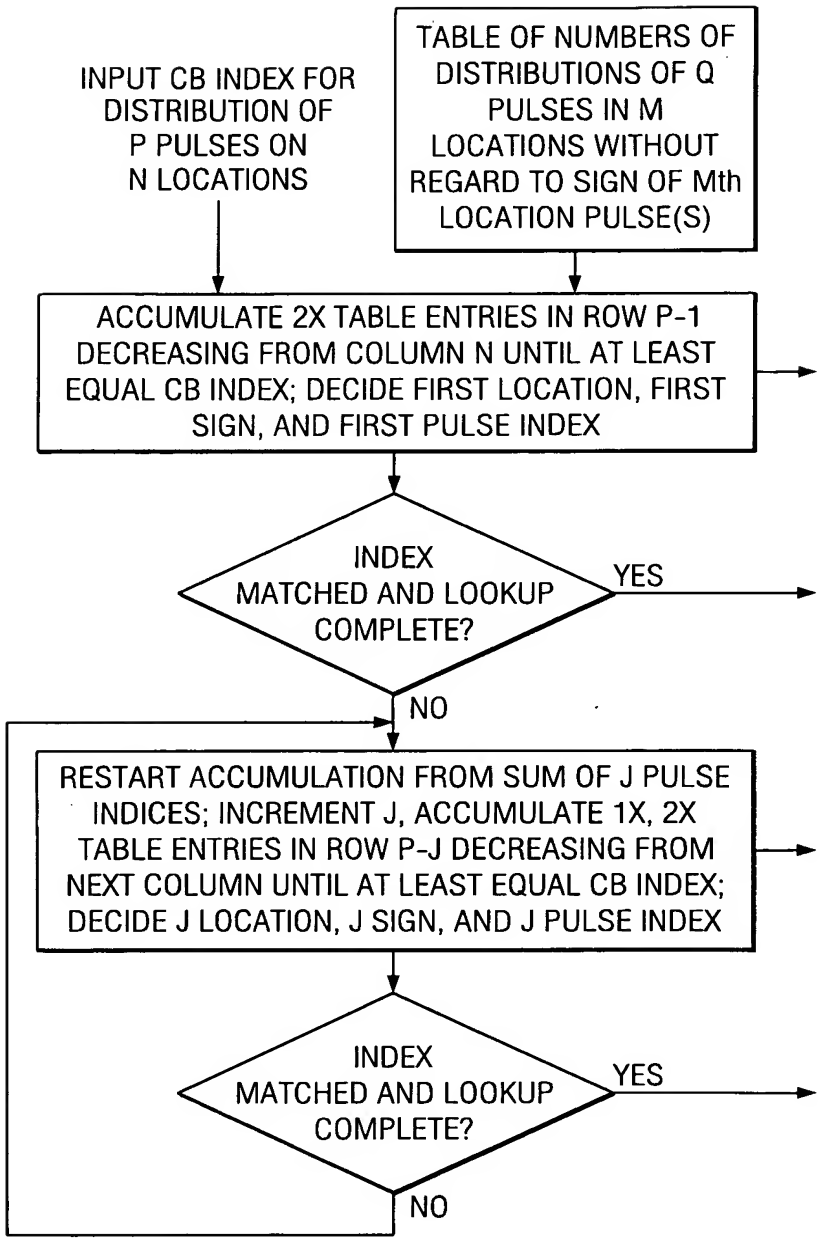
INPUT CB INDEX FOR DISTRIBUTION OF P PULSES ON N LOCATIONS
TABLE OF NUMBERS OF DISTRIBUTIONS OF Q PULSES IN M LOCATIONS WITHOUT REGARD TO SIGN OF Mth LOCATION PULSE(S)
ACCUMULATE 2X TABLE ENTRIES IN ROW P-1 DECREASING FROM COLUMN N UNTIL AT LEAST EQUAL CB INDEX; DECIDE FIRST LOCATION, FIRST SIGN, AND FIRST PULSE INDEX
INDEX MATCHED AND LOOKUP COMPLETE?
YES
NO
RESTART ACCUMULATION FROM SUM OF J PULSE INDICES; INCREMENT J, ACCUMULATE 1X, 2X TABLE ENTRIES IN ROW P-J DECREASING FROM NEXT COLUMN UNTIL AT LEAST EQUAL CB INDEX; DECIDE J LOCATION, J SIGN, AND J PULSE INDEX
INDEX MATCHED AND LOOKUP COMPLETE?
YES
NO

FIG. 1c

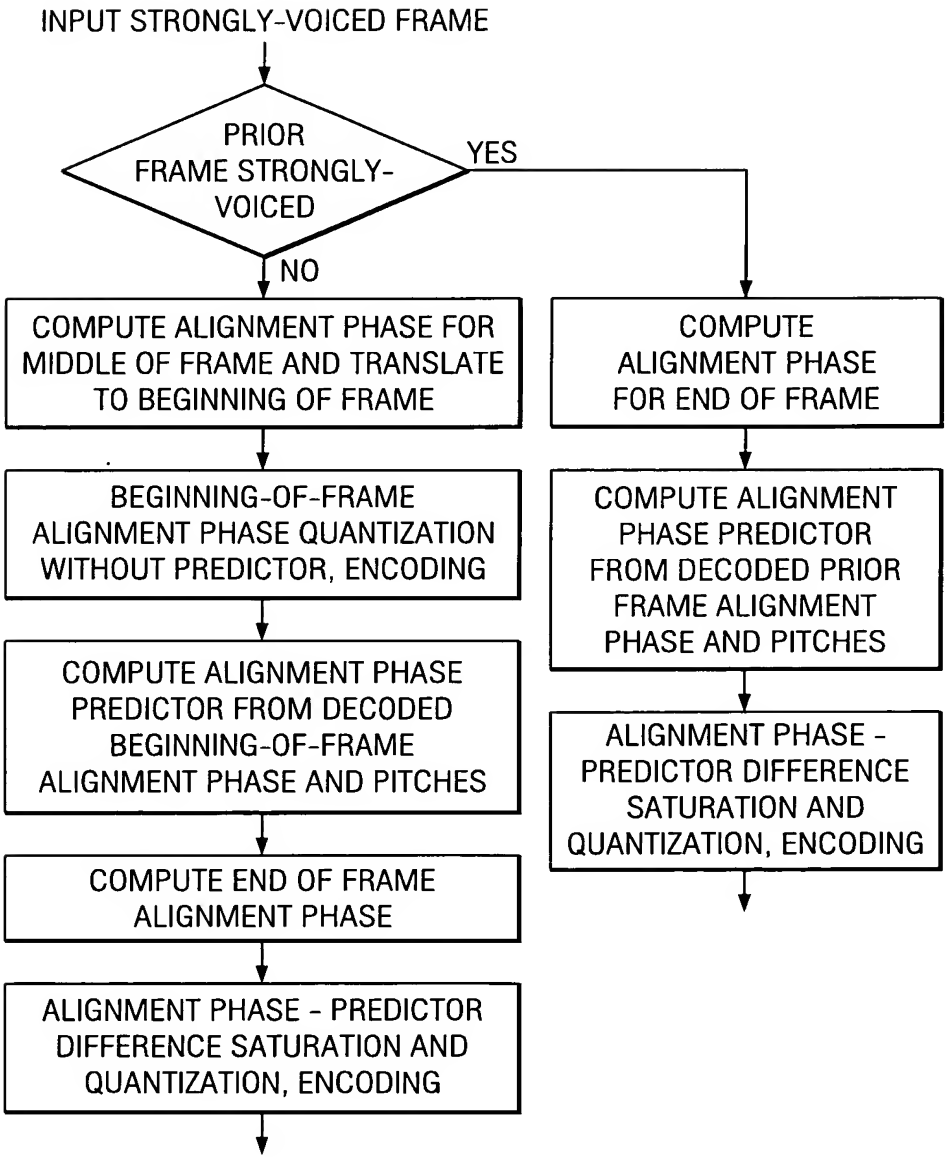
INPUT STRONGLY-VOICED FRAME
PRIOR FRAME STRONGLY-VOICED
YES
NO
COMPUTE ALIGNMENT PHASE FOR MIDDLE OF FRAME AND TRANSLATE TO BEGINNING OF FRAME
BEGINNING-OF-FRAME ALIGNMENT PHASE QUANTIZATION WITHOUT PREDICTOR, ENCODING
COMPUTE ALIGNMENT PHASE PREDICTOR FROM DECODED BEGINNING-OF-FRAME ALIGNMENT PHASE AND PITCHES
COMPUTE END OF FRAME ALIGNMENT PHASE
ALIGNMENT PHASE - PREDICTOR DIFFERENCE SATURATION AND QUANTIZATION, ENCODING
COMPUTE ALIGNMENT PHASE FOR END OF FRAME
COMPUTE ALIGNMENT PHASE PREDICTOR FROM DECODED PRIOR FRAME ALIGNMENT PHASE AND PITCHES
ALIGNMENT PHASE - PREDICTOR DIFFERENCE SATURATION AND QUANTIZATION, ENCODING

FIG. 1d

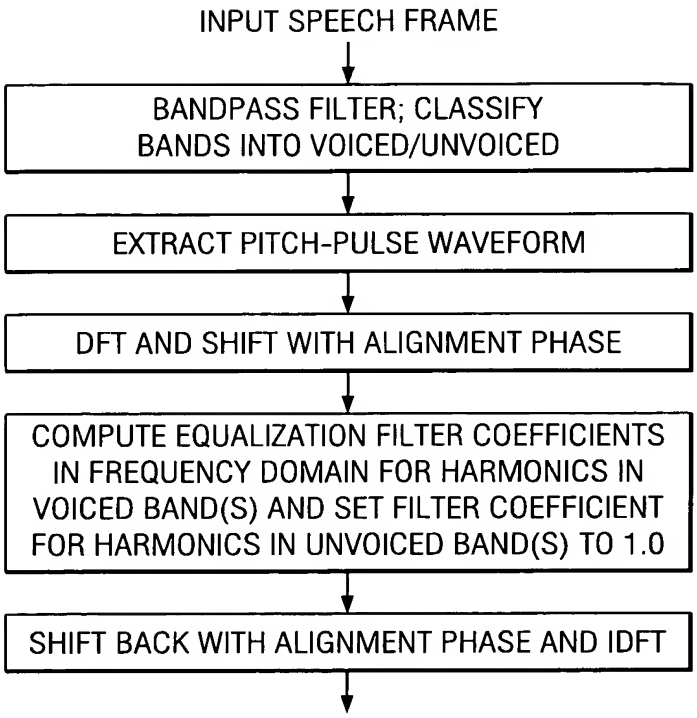
INPUT SPEECH FRAME
BANDPASS FILTER; CLASSIFY BANDS INTO VOICED/UNVOICED
EXTRACT PITCH-PULSE WAVEFORM
DFT AND SHIFT WITH ALIGNMENT PHASE
COMPUTE EQUALIZATION FILTER COEFFICIENTS IN FREQUENCY DOMAIN FOR HARMONICS IN VOICED BAND(S) AND SET FILTER COEFFICIENT FOR HARMONICS IN UNVOICED BAND(S) TO 1.0
SHIFT BACK WITH ALIGNMENT PHASE AND IDFT

FIG. 1e

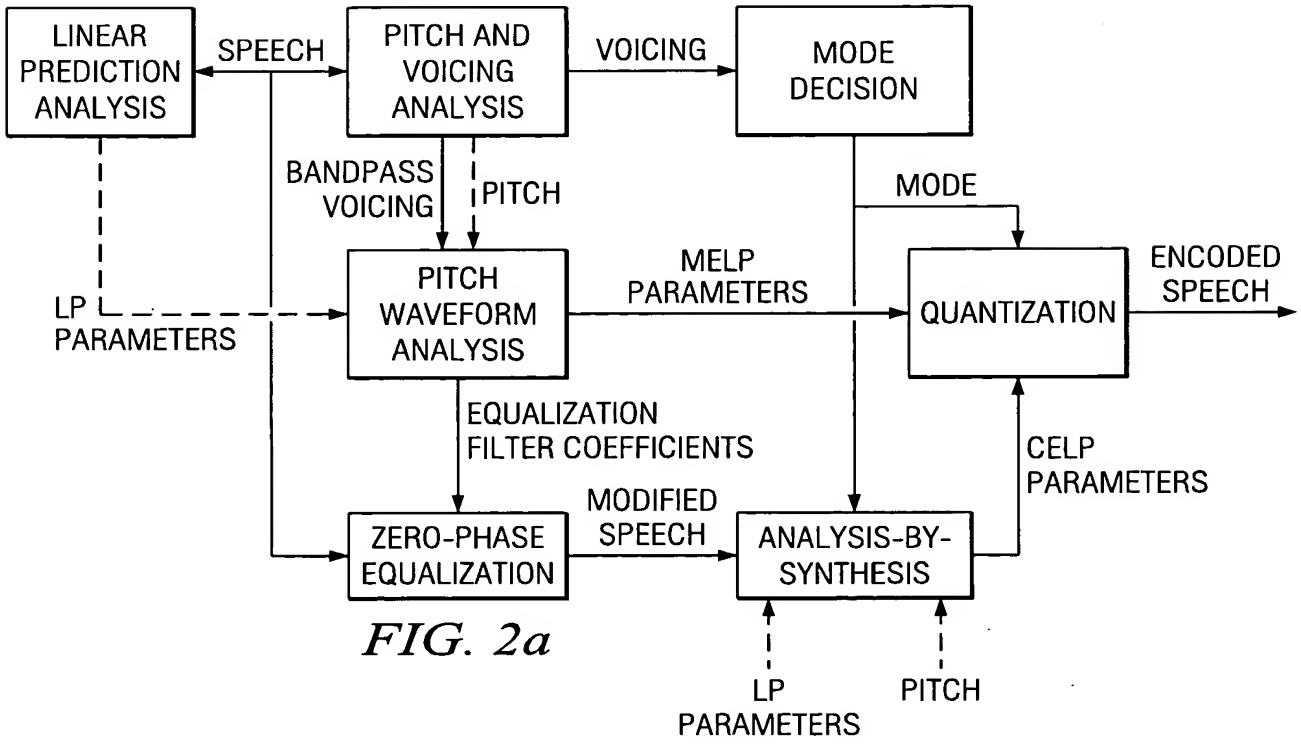
LINEAR PREDICTION ANALYSIS
SPEECH
PITCH AND VOICING ANALYSIS
VOICING
MODE DECISION
BANDPASS VOICING
PITCH
MODE
LP PARAMETERS
PITCH WAVEFORM ANALYSIS
MELP PARAMETERS
QUANTIZATION
ENCODED SPEECH
EQUALIZATION FILTER COEFFICIENTS
CELP PARAMETERS
MODIFIED SPEECH
ZERO-PHASE EQUALIZATION
ANALYSIS-BY-SYNTHESIS
LP PARAMETERS
PITCH

FIG. 2a

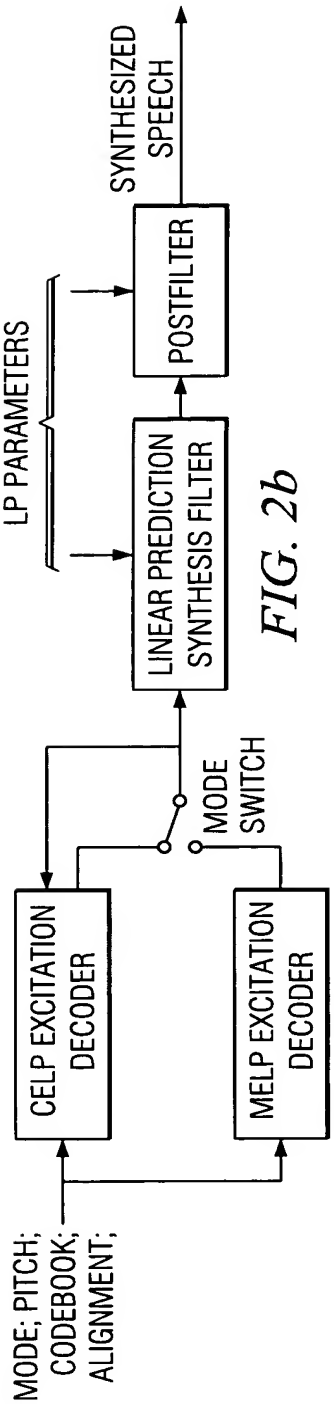
MODE; PITCH; CODEBOOK; ALIGNMENT;
CELP EXCITATION DECODER
MELP EXCITATION DECODER
MODE SWITCH
LINEAR PREDICTION SYNTHESIS FILTER
LP PARAMETERS
POSTFILTER
SYNTHESIZED SPEECH

FIG. 2b

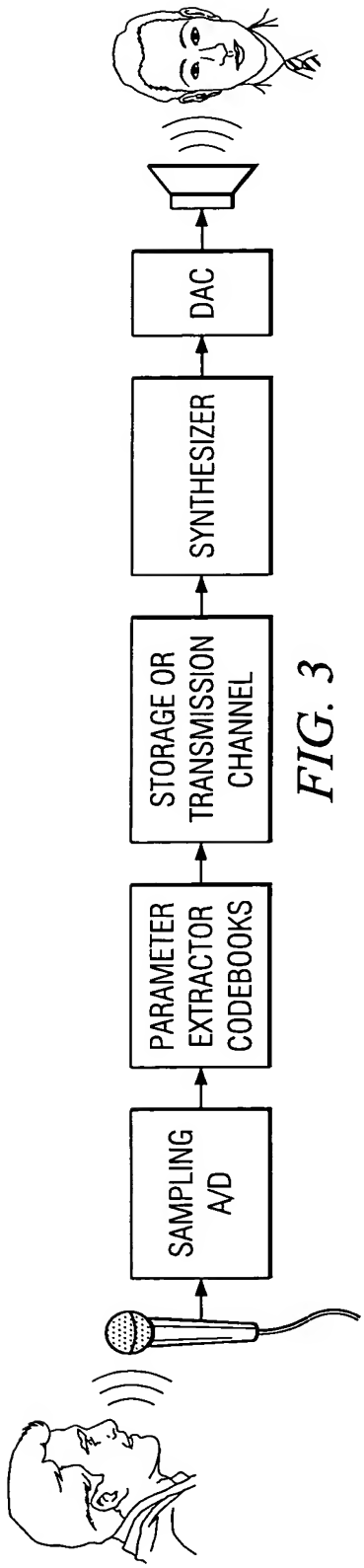
SAMPLING A/D
PARAMETER EXTRACTOR CODEBOOKS
STORAGE OR TRANSMISSION CHANNEL
SYNTHESIZER
DAC

FIG. 3